

## Best Practices of Technology Integration

**Title:** *And The Beat Goes On.....!*

**Subject Area:** Life Science (Language Arts & Technology)

**Intended Grade Level(s):** Middle School 6-8

### **Description:**

This lesson is a “pulsating” culmination investigation of the circulatory system! This dissection of the heart demonstrates the path that blood takes through the heart and the circulatory system. Students will identify the structures and functions of the heart as presented during a dissection as teacher demonstrates using a document camera (ELMO). Students will practice the procedures used to dissect an animal’s heart.

Two follow-up activities include an online exploration of the heart and reflective letter written to a family member describing the steps involved as well as their own feelings regarding the activity.

### **Curriculum Benchmarks:**

#### [MI.SCI.III.2.MS.4](#)

Explain how selected systems and processes work together in plants and animals. (*Key concepts:* Systems/Processes-digestion, circulation, respiration, endocrine, reproduction, skeletal, muscular, nervous, excretion, transport, growth, repair. *Real-world contexts:* Interrelations of body systems during selected activities, such as among skeletal, muscular, circulatory, and respiratory systems during physical exercise.)

#### [MI.SCI.I.1.MS.7](#)

Write and follow procedures in the form of step-by-step instructions, recipes, formulas, flow diagrams and sketches. (*Key Concepts:* Purpose, procedure, observation, conclusion. *Real-world contexts:* Following a recipe, listening or creating the directions for completing a task.)

### **Materials/Hardware/Software:**

Specimens/ Hearts (one per group of 4-5 students), heart models, newspapers, trays, rubber gloves, aprons (trash bags), paper towels, dissecting scissors and/or scalpels, disinfectant spray, straws, 36 large zip-loc baggies, Resource Persons/ Parent Volunteers, ELMO Document Camera, video equipment, heart dissection procedure hand-outs.

## Activities/Procedures:

Preparation- Rinse/soak preserved hearts. Place each heart into a zip-loc baggie. Prepare all dissection materials needed for each group and place into dissecting tray. Set-up the ELMO document camera at front of class for demonstration of dissection. Place students' hand-made "aprons", newspapers, gloves, and dissection procedure sheets out near entrance.

Preparing the class - First connect the dissection with the previous lessons on the circulatory system by asking students to pump their fists if they remember what muscle is the strongest muscle of the body. Explain that the dissection today will allow them to see the various structures of the heart and review the flow of blood through the heart. Next, discuss wearing gloves as part of universal precautions to prevent possible infection from the specimens. Discuss Laboratory Safety Rules. Explain the dissection format to the class. The teacher will demonstrate the entire procedure using the ELMO and classroom monitors while students observe. Then students will follow the step-by-step procedure sheet with help from teacher and parent volunteers. Lastly, introduce each of the parent volunteers and/or student aids to the class.

\* Students will remain seated and observe teacher demonstration first, then begin with their dissection as follows:

### A. EXTERNAL OBSERVATIONS –

- 1.) Observe the heart. **Ask:** *Where did it come from? What kind of animal is it from?* **Explain:** The size of the heart depends on the size of the animal.
- 2.) Make a fist of your hand and hold it over the heart specimen. **Explain:** Your fist is the size of your heart. **Ask:** *Which is the larger animal?*
- 3.) Touch/feel the reddish brown tissue on the heart. **Ask:** *How does it feel? What kind of tissue is this? What is the heart muscle's job?* Now touch/feel the cream-colored tissue around the top edge of the heart. **Ask:** *What kind of tissue is this? Why does the heart have this fat on it?*
- 4.) Observe the lines that are all over the heart. **Ask:** *What are these lines?*
- 5.) Hold the heart in two hands with the top up and pointed end down. **Ask:** *How can you tell which is the top of the heart? What does the bottom look like?*
- 6.) Squeeze the sides until you can identify a soft, thinner side and a hard, firmer side. **Ask:** *One of the sides of the heart is thicker than the other. Do you know why?* (The left side because it pumps blood to the whole body while the right side only supplies the lungs)

### B. INTO THE RIGHT SIDE OF THE HEART –

- 1.) Find the right side of the heart by feeling for the thinner side.
- 2.) Find the vena cava by looking for two thin walled, dark veins that open into the right side of the heart.
- 3.) Insert a finger into the vena cava and then the right atrium and right ventricle.
- 4.) Take your finger out and insert a coffee stir stick where your finger was. Take your scissors and cut along the stick to the apex. Pull that side of the heart open. Observe.
- 5.) Put your finger under the strings or strands that look like threads. Look at the transparent membranes that form the valve.

### C. OUT FROM THE RIGHT SIDE TO THE LUNGS –

- 1.) Find the opening that leads out of the right ventricle to the lungs by poking a finger up and toward the midline/center.
  - 2.) Place the stir stick into the opening and through the pulmonary artery and cut along its length.
- D. FROM THE LUNGS, INTO THE LEFT SIDE –
- 1.) Hold the heart and find the opening on top of the left side that opens into the left atrium.
  - 2.) Remove your finger and insert a straw where your finger was. Push it all the way down, and then cut along its length to the apex.
  - 3.) Compare the two valves and the thickness of the wall on the right and left sides of the heart.
- E. OUT THE LEFT SIDE TO THE BODY –
- 1.) Find the opening from the left ventricle by pushing a finger up and toward the midline of the heart and out the aorta.
  - 2.) Insert a stir stick where your finger was and cut along its length. Open the aorta.
  - 3.) Look at the walls of the aorta.
  - 4.) Look carefully for a small opening just above this valve.

**Closure/Wrap-up:**

When dissection is completed, have students properly discard the hearts by wrapping them in newspaper and zipping them back into their zip-loc baggies. Dismiss groups of students to discard the hearts into the trash bin, take off their gloves, and thoroughly wash their hands. Ask students to come to class tomorrow prepared to discuss their dissection experience with the class.

**Assessment/Evaluation:**

Students will be informally evaluated using a checklist on their cooperative group participation and on following dissection and safety procedures.

Formal assessment will be identification of parts of the hearts (leftover hearts or plastic heart models) that have parts numbered.

**Follow-up Activities:**

(Language Arts Integration)

A discussion regarding the dissection experiences will be conducted the following day. After the discussion, students will write a letter to their parent/families describing their reactions to the dissection using writing prompts from the teacher. The students' formal letters will be sent home with teacher signature (for assessment) the next day.

(Technology Integration)

An online exploration of the heart (appendix A) following the dissection can be conducted at: [www.fi.edu/biosci/heart.html](http://www.fi.edu/biosci/heart.html)

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